

What Is Claimed Is:

1. An electrical, decentralized braking system having:

at least four sensors (S1 to S4) for sensing the actuation of a brake actuating device;

one wheel-braking module (10) for each brakable vehicle wheel (13), for acquiring sensor data and for controlling a braking device of a corresponding wheel (13);

at least one first communication device (14) with which all braking modules (10) are connected to one another for the exchange of data; and

an electrical connecting device (12, 12') by which each sensor (S1 to S4) is connected to at least one braking module (10),

wherein the braking system has at least one further communication device (14', 14'') for receiving and/or exchanging data between at least two wheel modules (10) of different sides (R, L) of the vehicle.
2. The braking system as recited in Claim 1, wherein the construction of the second communication device (14') is identical to that of the first communication device (14), and each sensor (S1 to S4) is connected to a second wheel module (10) of the opposite side of the vehicle (R, L), on the same axle.
3. The braking system as recited in Claim 1, wherein a front wheel module (10) of one side of the vehicle (R) is connected to a rear wheel module (10) of the other side of the vehicle (L) via a second communication device (14'), and a front wheel module (10) of the other side of the vehicle (L) is connected to a

rear wheel module (10) of the one side of the vehicle (R) via a third communication device (14''), for the exchange of data.

4. The braking system as recited in Claim 1 or 2, wherein more than four sensors (S1 to S4), allocated in pairs to the wheel modules (10), are provided for sensing the actuation of the brake actuating device.
5. The braking system as recited in one of the preceding claims, wherein the communication devices (14, 14', 14'') are formed by serial bus systems.
6. The braking system as recited in one of the preceding claims, wherein the data that are able to be exchanged via the communication devices (14, 14', 14'') include sensor data of the sensors (S1 to S4).
7. The braking system as recited in one of the preceding claims, wherein the braking modules (10) each have a device (11) for determining the actuation strength of the brake actuating device.
8. The braking system as recited in one of the preceding claims, wherein the braking system is a passenger vehicle braking system having four brakable wheels (13).